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AN OPEN LOOK TO THE PAST: VIRTUAL AND IMMERSIVE APPROACH TO STUDY INQUISITORIAL *AUTOS DE FE* IN COLONIAL MEXICO AND GUATEMALA

1. Introduction

The projects undertaken by *Praeteritas Urbes* have a fundamental aim: conducting thorough research and investigation to reconstruct both tangible and intangible cultural heritage using VR. Virtual recreation in cultural heritage is increasingly prevalent, offering advantages but also presenting methodological challenges that must be addressed. The advancement of modern technologies facilitates a new mode of engagement with cultural heritage, providing the opportunity to reach a vast audience. *Praeteritas Urbes* is an international and multidisciplinary group, composed of members from various institutions. It was founded in 2016 by Antonio Rodríguez Alcalá and John Chuchiak with the aim of recreating cities and events from the past, allowing them to be visited through virtual and augmented reality. The last project ('The *Auto de Fe* of Mani') started in 2022 and was presented to the public during a museum exhibition in Merida, Yucatan, beginning in February 2023.

Our research group's strategy is founded on an educational premise, yet the objectives of each project also acknowledge the role of emotions in the learning process. Consequently, our research is focused on recreating historical events that significantly shaped the region once known as the colony of New Spain and impacted Maya culture in diverse ways. These historical events, falling within the realm of intangible heritage, necessitate the use of a precise methodology in order to generate empathy for those who experienced these traumatic historical events.

2. The *Autos de Fe*

The *Auto de Fe*, literally 'act of faith', served as a processional and penitential ceremony of public repentance. It was developed by the Spanish Inquisition with elements borrowed from its predecessors, the medieval and papal Inquisitions, and this ceremony included a procession of penitents and tribunal officers, followed by a solemn mass with a special sermon of faith. Finally, the culmination of these ceremonies ended with the pronouncement of the sentences and punishments of those convicted heretics. Although these *Autos de Fe* served as a form of religious ritual, they also held political, cultural, and didactic meanings (Chuchiak, Duncan 2023). Little scholarly attention has been given to the *Auto de Fe* ceremonies of the early monastic and episcopal inquisitions in the New World, meaning that it became necessary

for our research group to take a closer look at the details, spatial aspects, and the power and hierarchical relationships of those historical actors and officials who became involved in these 'acts of faith' in the various regions where these monastic and episcopal ceremonies existed (Chuchiak, Duncan 2023).

The main sources used to study and reconstruct these events are the testimonies and documentation uncovered in various archives, which, as primary sources, provided first-hand information about the various ceremonies of the *Autos de Fe* which occurred in the past. For example, for the reconstruction of the staging of the *Auto de Fe* ceremony, which had a standardized structure, together with historical sources, we can also count on archaeological investigations that help to reconstruct some elements of the ephemeral architecture of these events as well as the traces of the artefacts destroyed during these public events. Another important and visual aspect of these ceremonies focuses on the recreation of the penitential processions of the prisoners and the Inquisition officials, which allowed us to concentrate on the creation of historical figures, or the protagonists who experienced these events. An important aspect of this recreation of the processions included the research and modeling of the penitential garments, called *sambenitos*, the accused heretics were compelled to wear as a symbol of public shame.

3. Methodology

The reconstruction process of these historical events is based on the Principles of Seville, which establish the basic principles and criteria for measuring the quality of projects carried out in the field of virtual archaeology, especially noting the historical rigor and scientific transparency of the models generated (ICOMOS 2017). To respect these principles, several methodologies have been created and are very important to refer to when it comes to 3D reconstructions or virtual recreations. One of these focused on the use of a so-called scale of historical-archaeological evidence, a methodology and visual representation of the sources used in the recreation which ensures adherence to historical rigor and scientific transparency. The basic reconstruction of this method of documenting virtual models can be summarized as follows: 1) it is an immediate visual tool to understand the level of historical-archaeological evidence of each part of a virtual reconstruction; 2) warmer tones indicate a higher level of evidence while cooler tones refer to a lower level of evidence (Aparicio Resco 2022). The visual scale of historical-archaeological evidence was used in all our *Auto de Fe* projects, especially for the architectural reconstruction of the former Convent of St. Michael the Archangel in the 16th century Maya town of Maní (Yucatán).

Through the study of primary and secondary sources, it became possible to extract and document the information necessary to reconstruct these various

historical events. For these reconstructions, primary sources like archival documents and archaeological remains served as the major historical sources for our reconstruction; while secondary sources, such as elements of similar events or ceremonies from other time periods or related contexts, allowed for an expanded source base which helped to give a more complete picture of the elements that would serve as part of the various historical recreations.

In this paper, we will illustrate our process of recreating historical simulations by briefly describing examples of two projects which focused on the recreation of an *Auto de Fe* ceremonies from the Colonial Period in New Spain, highlighting examples of the methodology adopted in our process of virtual historical simulations: the Great episcopal *Auto de Fe* of Santiago de los Caballeros (1554) and the monastic *Auto de Fe* of Maní (1562).

3.1 *The Great episcopal* Auto de Fe *of Santiago de Guatemala (1554)*

For the recreation of the event known as the Great *Auto de Fe* of Santiago de los Caballeros (1554), an architectural team developed a model of the architecture of the main square of the Spanish colonial capital of Guatemala, Santiago de los Caballeros, the scene of the Great *Auto de Fe* of 1554. A second team, aided by a group of historians and historical architects, undertook the design and recreation of the staging of the platforms used by the Spanish authorities who took part in this historical event. Since numerous historical documents accurately described aspects of this wooden staging for this historical event, a plausible model for the staging was created. In parallel, an historical research team provided and analyzed the surviving historical documents which described the order and nature of the events that happened on the day of the *Auto de Fe*, as well as providing access to representative archaeological objects and historical pieces that were going to be exhibited in a small museum exhibit, and their photogrammetric products which would also be utilized in the virtual simulation. Subsequently, a game development team integrated all the information and the architectural and historical recreations into the VR scenario, and they modelled characters, assets, and optimized the final low-polygon assets for the simulation. Finally, a navigation team had the important task of designing the form of movement of the ultimate users, as well as the design of menus, callouts and welcome titles/credits (Fig. 1).

An important point was to decide upon the type of Semantic Model that would be used. Due to the nature of the historical event recreated, it was decided on a Historical Reconstructed Scenario (HRS) that illustrated for the viewer aspects of the traumatic nature and harshness of the historical event, though the team chose to qualify (or soften) some of the more violent features of this 'act of faith': i.e. the 'didactic theatre' of punishment, ordered to be performed by Bishop Francisco Marroquín on the Maya penitents, was not recreated; nor was any interactivity designed to illustrate the nature of the

Fig. 1 – Virtual recreation of *Auto de Fe* of Santiago de los Caballeros.

Fig. 2 – Virtual recreation of *Auto de Fe* of Santiago de los Caballeros: the interaction with the ceramic.

punishments. It was decided instead to include interactivity with models of the 'idols' destroyed in the bonfires that were arranged in the center of the square, as well as callouts with relevant information concerning the buildings in the plaza of Santiago, or detailed descriptions of various elements of the staging and the ceremony. It was decided to create a pre-awareness sensitivity room with navigation instructions, as well as a brief description of the historical event, and a panel with the project credits.

The interactivity of the staging of the HRS was limited to interacting with a sample of the archaeological pieces that were physically exhibited in the museum, allowing users to take them in their 'virtual-hands' and instructing them to throw them into the bonfire just as the Maya penitents were forced to do. Interior lights indicated those virtual archaeological pieces that were possible to 'grab' in the scenario. On the virtual recreation of the staging, the most important reconstructed pieces of the project were illustrated by placing more call-outs explaining the different parts of the staging, the characters involved, and the inclusion of a soundtrack of the liturgical chant *Iudica me Deus* (*Judge me my God*, Psalm 43), which, according to the historical descriptions, was the song that accompanied the procession of the *Auto de Fe* (Fig. 2).

3.2 *The monastic* Auto de Fe *of Maní (1562)*

The second project, which illustrates the methodology used in our recreation of historical scenario projects, was the virtual recreation of the Franciscan monastic inquisition in Maní along with its *Auto de Fe* of 1562. The Maya town of Maní is a site located in the State of Yucatán, Mexico. This project was created in collaboration with the regional museum of the National Institute of Anthropology and History's (INAH), Museo del Palacio Cantón of Merida, as part of a special exhibition entitled Ídolos*: Persistencias y resistencias mayas*.

This project focused on two different aspects related to the Virtualization of Heritage: it included the digital VR recreation of a historical event along with the creation of a virtual visit of the exhibition for the museum. The *Auto de Fe* of Maní (1562) was a very significant historical event, carried out by the monastic inquisitor, Fray Diego de Landa (León Cázares 2003). In this public event, hundreds of indigenous people were condemned and punished for various crimes related to what the friars called 'idolatry' (Scholes, Adams 1938). In addition, dozens of hieroglyphic codices (or books) and thousands of Maya cultural objects considered 'idolatrous', including tens of thousands of ceramic and wooden 'idols', were burned as a final act of extirpation (Carrillo y Ancona 1979).

As part of the proposal for the recreation of this historical event, three elements had to be taken into consideration, each of which required a precise methodology: the architectural reconstruction, the recreation of the historical characters, and the reconstruction of the cultural objects for the exhibition. In terms of the architectural reconstruction, the main element of the historical scenario required the reconstruction of the former convent of St. Michael the Archangel in the town of Maní, for which it was necessary to combine evidence from fieldwork (especially the use of photogrammetry) with archival and bibliographical research for historical documentation (Díaz de León Alcalá, Ordaz Tamayo 2022).

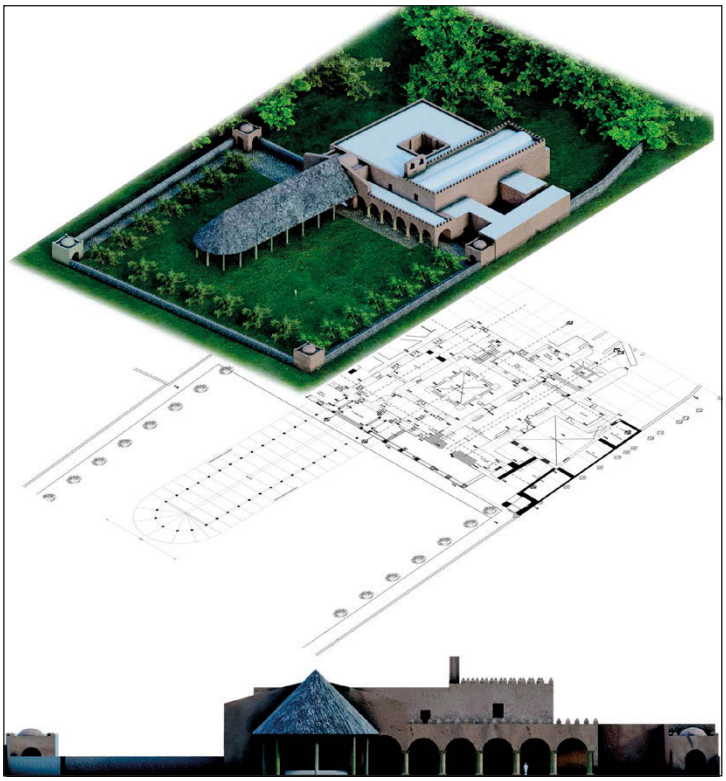

Fig. 3 – Virtual reconstruction of Saint Michael Archangel convent in 1549-1588.

The initial fieldwork focused on the exterior of the ex-convent, through the use of an aerial reconnaissance of the convent complex which compiled hundreds of images using a drone, and a photographic series of shots of the interior spaces, to obtain a photogrammetric model of the current stage of construction. The process was carried out by using Agisoft Metashape software. Secondly, by comparing the model obtained with the results of the archival research, it was possible to propose different theoretical phases of the construction of the Maní convent. In particular, the construction phases likely dated initially from between 1549 and 1588 and evidence of the remains of this period contained the elements that were perhaps visible at the time of the *Auto de Fe* (Díaz de León Alcalá, Ordaz Tamayo 2022). After this process, a model of the convent, as it may have existed in the decade of the 1560s, was completed by using the software Blender for its subsequent insertion and integration into the Unreal Engine used for the VR reconstruction (Fig. 3).

Fig. 4 – Virtual reconstruction of *Auto de Fe* of Maní, procession and characters.

The second important element within the recreation of the *Auto de Fe* concerned the recreation of the historical Spanish and Maya characters and the assets and cultural objects used in the staging and during the public event. In both cases, the main software used for the modeling was the open source software Blender. For the recreation of characters, however, our team used the MakeHuman program, which is also an open source software, and finalized them in Blender. Once the character creation process was complete, our team moved on to creating other physical features and other elements such as historically accurate clothing and accessories. Each character, once completed with the addition of textures and animations, was exported from Blender to be loaded into the Unreal Engine software, where the final VR scene was created (Fig. 4).

The last component of the 3D reconstruction was the digitization and photogrammetry of the artefacts displayed in the physical museum exhibition. The methodology used for the photogrammetric process consisted of taking images from the pieces *in situ* and processing the data through software such as Agisoft Metashape and later post-processing these models in Blender and Substance Painter. As a result, a digital archive of these digital models was created and is freely accessible online (Fig. 5). The main idea of the exhibition was to utilize the collection of the Museo Regional de Antropología, Palacio Cantón as surviving examples of the many thousands of artefacts that were destroyed in the *Auto de Fe* in Maní. On display also were fragments of the actual objects destroyed in the event which were recovered thanks to the archaeological research of Dr. Tomás Gallareta Negrón in 2015, which uncovered part the location of the major bonfire near the town of Maní's main plaza.

Fig. 5 – Photogrammetric reconstruction of a censer for the exhibition *Ídolos. Persistencias y resistencias mayas*.

4. Results

In both simulations, the most valuable results were the interaction of the end users (the museum visitors) with the virtual experiences and their derived products, since an immersive experience is currently one of the main goals of public engagement and dissemination of knowledge for scientific products. In formulating general dissemination strategies for these projects, it was advisable to create differentiated impacts for each segment of the exhibits, considering factors such as age range, degree of specialization, and depth of knowledge that our team aimed to offer for the viewers. Through various user satisfaction and verification instruments, such as exit surveys, virtual suggestion boxes, interactive pieces in Augmented Reality, and thematic workshops, users interacted with the content of these projects and generated valuable feedback for the work teams, who have subsequently evaluated and incorporated these suggestions into subsequent iterations and revisions of the projects.

In general, both experiences have had a high impact on the users of these exhibits, since in most cases they expressed that they were unaware of many of these said historical events; or if they knew about them, they had only a superficial knowledge of the events, or had held erroneous views of the facts. The most important suggestions were to raise the graphic standards, the enhancing of viewer interactions or adding more musical backgrounds that resemble those of the video game. Other suggestions included the incorporation of a greater variety of online and offline outputs to continue the viewers with the interaction and understanding of the contents of the projects, or in order to have a greater number of devices available to have more interaction time for each museum viewer. And last, some comments led the team to consider issues of inclusion and adaptations for a wider access of the models for people with various disabilities.

5. Conclusion

The museum exhibitions and projects of the *Auto de Fe* of Santiago de los Caballeros (1554) and the *Auto de Fe* of Maní (1562), more than 470 years after these events, offered the public an act of historical reconciliation that activated first-person reflections in relation to the events and the cultural continuity of the Maya people and their culture of resilience and persistence. By offering VR immersive views of these *Autos de Fe*, these lost historical events, and their intangible cultural patrimony, can be experienced with new technologies in a hands-on experience through augmented reality and immersive interactive exposition rooms. The goal of these scenarios was to communicate the cultural greatness of the Maya of Guatemala and Mexico in pre-Hispanic times and the cultural divergences which occurred with the European encounter. By generating a virtual recreation of these *Autos de Fe* with their recreated cultural settings and elements based on the historical, architectural and archaeological sources extant, our team aimed to establish historical empathy in the viewers. We hoped to offer the viewers of these exhibitions a first-person view of the dimension of the losses of cultural objects which occurred during these events, and a firsthand view of the clash of cultures inherent in colonialism, thereby activating reflections on the value of cultural differences and the need for tolerance in our present day.

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ABSTRACT

Virtual Reality is one of the tools that has become widely used in recent years, in the field of cultural heritage. This tool has proven to be particularly valuable, especially for approaching intangible cultural heritage. Using free and open source software for 3D modeling and animation, such as Blender and Unreal Engine, the international research group, *Praeteritas Urbes*, focused on the reconstruction of historical events such as the inquisitions many *Autos de Fe*, which had a significant impact on the colonial history of Central America. In this paper, we will present the results of two different projects: 'The Great *Auto de Fe* of Guatemala', which took place in Santiago de Guatemala in 1554, and 'The *Auto de Fe* of Maní' (Yucatán, Mexico), which occurred in 1562. In both cases, our objective was to make simulations of these two events known and accessible to the public, using a precise methodology, following the scale of evidence, and adhering to the standards established in the Principles of Seville codified in 2017.